

### **REMARKS**

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application. Claim 37 has been amended, no Claims have been cancelled and no new Claims have been added.

The Examiner has rejected Claims 37-48, 51 and 52 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,000,241 by Ranade et al. in view of U.S. Patent No. 5,106,304 by Chronister.

The Examiner admits that Ranade et al. do not teach treating the glass powder to increase its surface area. However, the Examiner states that Chronister discloses known methods of treating glass filler particles, including etching with an acid. The Examiner also states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the etching treatment of Chronister on the powders of Ranade et al. because Chronister taught that such treatment make work times and set times adjustable. The Examiner also states that Chronister does not teach increasing the surface area by at least 100 percent, but that the specific process conditions recited are not critical but are merely optimal for the particular material being treated and they would be within the skill of the art. The Examiner states that a person of skill in the art would have conducted the etching treatment for a long as necessary to achieve a desired surface area increase.

The Examiner states that Ranade et al. does not teach that the glass particles have no greater than 0.1 atomic percent impurities and it would have been obvious to a person skilled in the art at the time the invention was made to make the glass particles with less than 0.1 atomic percent impurities because applicant is not entitled to a patent for an article which after being produced has a greater degree of purity than a product of former methods. In this regard, the Examiner cites *In re Merz*, 38 U.S.P.Q. 143.

The Examiner also states that Ranade et al. does not teach that the glass particles are 95% of the theoretical density and that it would have been obvious to a person skilled in the art at the time the invention was made to make the particles 95% of their theoretical density because as particles, the glass would become 100% dense merely by permitting the droplets to fully react and coalesce.

The Examiner states that Ranade et al. does not teach that the particle size distribution had no greater than 30 weight percent of the droplets in the aerosol larger than twice the weight average droplet size; and it would have been obvious to a person skilled in the art at the time the invention was made to produce such a particle size distribution because the statistical composition of the particle sizes was controllable with the disclosed droplet classification means, i.e. virtual impactor and/or inertial separators.

Applicants respectfully traverse the foregoing rejections. Chronister is directed to a dental filling and sealing composition for human tooth restoration that includes pulverizing bovine teeth into small particles and separating the particles to extract enamel particles (see, e.g., the Abstract). The separated enamel particles can be combined with a glass ionomer cement or similar materials.

Chronister discloses in the Background of the Invention section that glass ionomer cements consist of a particulate glass powder and a mixing fluid which may generally be described as an aqueous solution of polycarboxylic acid. The Examiner quotes Col. 2 of Chronister, where it is disclosed that "Work time and set time can also be adjusted by affecting the surface area of the glass particles, such as by etching with an acid..." The Examiner concludes that this is a teaching that the surface area of the glass particles should be increased via such an acid treatment.

However, Chronister and Ranade et al. both fail to recognize that substantially spherical glass particles, such as those produced by a spray pyrolysis method as recited in Claim 37, provide advantages in the properties of a dental glass filling composition. For example, the flow characteristics of a resin containing the particles can be improved. (See page 11, lines 14-22 of the present specification). However, due to the spherical shape, such particles typically do not have a sufficient surface area to adhere a sufficient number of silanating groups to the glass surface. The invention recited in Claim 37 exploits the advantages of spherical particles from spray pyrolysis with an increased surface area to advantageously give both properties (flowability and adherence) to the composition. As is disclosed at page 13, line 25 to page 14, line 2, ***a goal of the present invention is to increase the surface area while not interfering with the morphological benefits of the spherical glass.*** Neither Ranade et al. or Chronister recognize the value of this combination.

In view of the foregoing, Applicants respectfully request removal of this rejection with respect to Claim 37, and Claims 38-48, 51 and 52 which depend upon Claim 37.

The Examiner has rejected Claims 49, 50 and 53 under 35 U.S.C. 103(a) as being unpatentable over Ranade et al. in view of Chronister and further in view of U.S. Patent No. 3,973,972 by Muller. The Examiner states that Ranade et al. and Chronister fail to disclose annealing or coating of the glass powders. Muller taught annealing glass powder filler for use in dental restorations. The Examiner also states that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to anneal the powders of Ranade et al. or Chronister because Muller taught that glass ceramic powders were desirable for dental restorations. The Examiner further states that Muller also taught "silanizing" and coating the powders with resin and that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to coat the glass powders of Ranade et al. and Chronister with resin because this was part of the process of building a dental restoration; and to silanate the powders to promote adhesion with the resin.

Claims 49, 50 and 53 depend upon Claim 37, traversed above. Therefore, removal of this rejection is also requested.

The Examiner has rejected Claims 54-58 under 35 U.S.C. 103(a) as being unpatentable over Ranade et al. and Chronister and further in view of U.S. Patent No. 5,977,204 by Boyan et al. The Examiner states that Ranade et al. and Chronister do not teach hydrolyzing the glass powder. The Examiner also states that Boyan et al. taught controlling the pH of a solution contacting a glass in order to control the hydroxyl concentration on the glass powder. The Examiner further states that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to do this with the glass of Ranade et al. because Boyan et al. taught that controlling the pH of a solution in contact with a glass surface and controlling the hydroxyl concentration at the surface was important in making the glass bioactive.

Applicants respectfully traverse this rejection. There is no need or desire to make the glass particles of the present invention "bioactive". Bioactive materials, as disclosed at Col. 1 of Boyan et al., have a high sodium and CaO content and a high calcium to phosphorous ratio to form interfacial bonds between the material and surrounding tissues.

Such is not the case for dental glass powders of the present invention and a person of ordinary skill in the art would not be motivated to look to Boyan et al. for a solution to the problems presented by dental glass compositions.

Therefore, removal of this rejection with respect to Claims 54-58 is requested.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecute and or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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